CLAIMS

1. An image pickup system for processing an image signal at each pixel which is composed of more than one color signals and one or more of the color signals are dropped out according to the location of the pixel, comprising:

first interpolation means for interpolating the color signals dropped-out from the image signals by a first interpolation method;

precision verification means for verifying the interpolation precision on the basis of the image signals and the color signals interpolated by the first interpolation means; and

second interpolation means for interpolating the color signals dropped-out from the image signals by a second interpolation method that is different from the first interpolation method in cases where it is judged that the interpolation precision by the first interpolation method is insufficient.

2. An image pickup system for processing an image signal at each pixel which is composed of more than one color signals and one or more of the color signals are dropped out according to the location of the pixel, comprising:

separation means for separating the image signals into first image signals and second image signals on the basis of predetermined characteristics relating to the image signals;

first interpolation means for interpolating the dropped-out color signals from the first image signals by a first interpolation method;

second interpolation means for interpolating the dropped-out color signals from the second image signals by a second interpolation method that is different from the first interpolation means;

precision verification means for verifying the interpolation precision on the basis of the first image signals and the color signals interpolated by the first interpolation means for the regions of the first image signals, and verifying the interpolation precision on the basis of the second image signals and the color signals interpolated by the second interpolation means for the regions of the second image signals; and

adjustment means for causing interpolation processing of the dropped-out color signals to be performed again from the image signals by the second interpolation means when insufficient interpolation was performed by the first interpolation means, and for causing interpolation processing of the dropped-out color signals to be performed again from the image signals by the first interpolation means when

insufficient interpolation was performed by the second interpolation means, in cases where it is judged that the interpolation precision is insufficient.

3. An image pickup system for processing an image signal at each pixel which is composed of more than one color signals and one or more of the color signals are dropped out according to the location of the pixel, comprising:

first interpolation means for interpolating the color signals dropped-out from the image signals by a first interpolation method;

second interpolation means for interpolating the color signals dropped-out from the image signals by a second interpolation method that is different from the first interpolation method;

precision verification means for verifying the interpolation precision on the basis of the image signals, the color signals interpolated by the first interpolation means and the color signals interpolated by the second interpolation means; and

selection means for selecting color signals having a higher interpolation precision between the color signals interpolated by the first interpolation means and the color signals interpolated by the second interpolation means.

4. The image pickup system according to claim 1, 2 or 3, characterized in that the first interpolation means or second

interpolation means comprises extraction means for extracting regions of a predetermined size centered on pixels of interest from the image signals, edge extraction means for extracting a plurality of edge intensities relating to predetermined directions from the pixels of interest within the regions, weighting calculation means for calculating weighting coefficients that are normalized from the edge intensities, interpolation signal calculation means for calculating a plurality of interpolation signals relating to predetermined directions from the pixels of interest within the regions, and calculation means for calculating the dropped-out color signals in the pixels of interest on the basis of a plurality of weighting coefficients relating to the predetermined directions and a plurality of interpolation signals relating to the predetermined directions.

5. The image pickup system according to claim 1, 2 or 3, characterized in that the first interpolation means or second interpolation means comprises extraction means for extracting regions of a predetermined size centered on pixels of interest from the image signals, and calculation means for calculating the dropped-out color signals in the pixels of interest within the regions by linear interpolation or cubic interpolation.

6. The image pickup system according to claim 1, 2 or 3, characterized in that the first interpolation means or second interpolation means comprises extraction means for extracting

regions of a predetermined size centered on pixels of interest from the image signals, correlation calculation means for determining as a linear equation the correlation between the respective color signals within the regions as a linear equation, and calculation means for calculating the dropped-out color signals on the basis of the image signals and the correlation.

7. The image pickup system according to claim 1, 2 or 3, characterized in that the precision verification means comprises correlation calculation means for determining correlation information relating to the correlations between the respective color signals for each predetermined region on the basis of the image signals and the color signals interpolated by the first interpolation means, and correlation verification means for verifying the interpolation precision on the basis of the correlation information.

8. The image pickup system according to claim 1, 2 or 3, characterized in that the precision verification means comprises hue calculation means for determining hue information for each pixel on the basis of the image signals and the color signals interpolated by the first interpolation means, and hue verification means for verifying the interpolation precision on the basis of the hue information.

9. The image pickup system according to claim 1, 2 or 3, characterized in that the precision verification means

comprises edge calculation means for determining edge information for each predetermined region on the basis of the image signals and the color signals interpolated by the first interpolation means, and edge verification means for verifying the interpolation precision on the basis of the edge information.

10. The image pickup system according to claim 2, characterized in that the separation means comprises edge calculation means for determining edge information for each predetermined region from the image signals, and image signal separation means for separating the image signals on the basis of the edge information.

11. The image pickup system according to claim 2, characterized in that the separation means comprises correlation calculation means for determining correlation information relating to the correlations between the respective color signals for each predetermined region from the image signals, and image signal separation means for separating the image signals on the basis of the correlation information.

12. The image pickup system according to claim 1, further comprising control means that can control such that the operation of the precision verification means and the operation of the second interpolation means are stopped.

13. The image pickup system according to claim 2, further comprising control means that can control such that the operation of the precision verification means and the operation of the adjustment means are stopped.

14. The image pickup system according to claim 3, further comprising control means that can control such that the operation of the second interpolation means and the operation of the precision verification means are stopped, and that can control such that when these operations are stopped, the selection means is caused to select only the color signals that are interpolated by the first interpolation means.

15. The image pickup system according to claim 12, 13 or 14, characterized in that the control means comprises information acquisition means for acquiring at least one type of information selected from a set comprising image quality information relating to the image quality of the image signals, image pickup mode information set in the image pickup system, and interpolation processing switching information that can be manually set, and judgment means for judging whether or not the operations are to be stopped on the basis of at least one type of information selected from a set comprising the image quality information, image pickup mode information, and interpolation processing switching information.

16. An image processing program for processing, by means of a computer, an image signal at each pixel which is composed

of more than one color signals and one or more of the color signals are dropped out according to the location of the pixel, the image processing program causing the computer to function as:

first interpolation means for interpolating the color signals dropped-out from the image signals by a first interpolation method;

precision verification means for verifying the interpolation precision on the basis of the image signals and the color signals interpolated by the first interpolation means; and

second interpolation means for interpolating the color signals dropped-out from the image signals by a second interpolation method that is different from the first interpolation method in cases where it is judged that the interpolation precision is insufficient.

17. An image processing program for processing, by means of a computer, an image signal at each pixel which is composed of more than one color signals and one or more of the color signals are dropped out according to the location of the pixel, the image processing program causing the computer to function as:

separation means for separating the image signals into first image signals and second image signals on the basis

of predetermined characteristics relating to the image signals;

first interpolation means for interpolating the color signals dropped-out from the first image signals by a first interpolation method;

second interpolation means for interpolating the color signals dropped-out from the second image signals by a second interpolation method that is different from the first interpolation means;

precision verification means for verifying the interpolation precision on the basis of the first image signals and the color signals interpolated by the first interpolation means for the regions of the first image signals, and for verifying the interpolation precision on the basis of the second image signals and the color signals interpolated by the second interpolation means for the regions of the second image signals; and

adjustment means for causing interpolation processing of the dropped-out color signals to be performed again from the image signals by the second interpolation means when insufficient interpolation was performed by the first interpolation means, and for causing interpolation processing of the dropped-out color signals to be performed again from the image signals by the first interpolation means when insufficient interpolation was performed by the second

interpolation means, in cases where it is judged that the interpolation precision is insufficient.

18. An image processing program for processing, by means of a computer, an image signal at each pixel which is composed of more than one color signals and one or more of the color signals are dropped out according to the location of the pixel, the image processing program causing the computer to function as:

first interpolation means for interpolating the color signals dropped-out from the image signals by a first interpolation method;

second interpolating means for interpolating the color signals dropped-out from the image signals by a second interpolation method that is different from the first interpolation method;

precision verification means for verifying the interpolation precision on the basis the color signals, the color signals being interpolated by the first interpolation means and by the second interpolation means; and

selection means for selecting color signals that have a higher interpolation precision between the color signals that are interpolated by the first interpolation means and the color signals that are interpolated by the second interpolation means.